PRODUCT DATA SHEET

SMG411

IP/MPLS Edge Router

In-house developed SMGOS software, advanced routing and MPLS capabilities, PTP support, and a modular hardware architecture

SMG411 is a compact IP/MPLS edge router platform powered by SMGOS®—an in-house developed network operating system by Simgenet. Designed for access and edge-layer scenarios, it delivers advanced routing and MPLS capabilities, IEEE 1588 PTP v2 support, and a modular, PCIe-based expansion architecture with 1G and 10G Ethernet uplink options. It supports MPLS-TE, SR-MPLS, BGP, OSPF, IS-IS, BFD, and VRF-based services.

1. SMGOS® — IN-HOUSE DEVELOPED IP/MPLS ROUTİNG SOFTWARE

SMGOS is an IP/MPLS routing operating system developed entirely in-house by Simgenet. It provides both CLI and web-based management interfaces. It has no dependency on third-party routing software, delivering full control, customization, and long-term sustainability.

SMGOS CLI Design Approach

While preserving a Cisco IOS-like syntax and operating logic, SMGOS is designed to reduce operational complexity—especially for advanced configurations such as MPLS-TE. Instead of multiple contexts and cross-referenced configurations, required settings can be defined clearly, directly, and understandably through a single CLI line.

- ✓ No dependency on third-party routing software
- ✓ Full control, customization, and long-term sustainability
- ✓ Architecture optimized for critical infrastructure and service provider networks
- ✓ Cisco IOS-like CLI — no additional training required

2. ROUTİNG, MPLS, AND SERVİCE PROTOCOL SUPPORT

Core Routing Capabilities

- Static Routing
- Default Routing
- Policy-Based Routing (PBR)
  - Route redistribution between routing protocols

IGP Protocols

- RIP v2
- OSPFv2 / OSPFv3
  - IS-IS (Level-1 / Level-2) | IS-IS Wide Metrics

BGP Capabilities (Advanced)

- iBGP / eBGP
- BGP Multipath | ECMP
  - BGP Communities and Extended Communities

  - Local Preference, MED, AS-Path manipulation
  - Prefix-list, route-map, and community-based routing policies
- Graceful Restart | Graceful Shutdown | Session Recovery
- Route Aggregation / Summarization | BGP Add-Path

MPLS and Advanced MPLS Capabilities

- IP MPLS | MPLS LDP
- MPLS L2VPN | MPLS L3VPN
  - VRF-based MPLS services
- Segment Routing (SR-MPLS)
  - MPLS label operations (push / pop / swap)
- MPLS PHP (Penultimate Hop Popping)
- MPLS TTL propagation control

MPLS Traffic Engineering

- MPLS Traffic Engineering (MPLS-TE)
- RSVP-TE
- Constraint-based path selection
  - Explicit and dynamic LSP definition

Fast Convergence and Load Sharing

- **Fast Convergence**: Millisecond-level rerouting on link/neighbor failures
- **ECMP** (Equal-Cost Multi-Path): Traffic distribution across multiple equal-cost paths
- **BFD** (Bidirectional Forwarding Detection): Very fast detection of link and path status
- **Advanced timer settings**: Hello / dead / keepalive / holdtime tuning

IP Address Management and Services

- DHCP Server / DHCP Relay
  - VRF-aware services
- IPv4 / IPv6 Dual-Stack Routing
- ARP / IPv6 Neighbor Discovery
- Source NAT (SNAT) | Destination NAT (DNAT) | Port Address Translation (PAT)
  - VRF-aware NAT support

Overlay and Virtualized Network Support

- VXLAN support
- Compatible with overlay network architectures and virtualized infrastructures

Network Management, Monitoring, and Security

- Centralized network monitoring and management with SNMP support
- Performance, status, and alarm monitoring
- Syslog support
- Centralized authentication and authorization with RADIUS (AAA) integration
- IPsec / OpenVPN (secure overlay services)

3. TİME SYNCHRONİZATİON — PTP AND NTP

For critical infrastructures that require time awareness and event correlation, SMG411 provides IEEE 1588-2008 PTP v2 support.

PTP Parameter	Value
Standart	IEEE 1588-2008 (PTP v2)
Network Transport	UDP/IPv4 and Layer 2
Delay Mechanism	End-to-End (E2E)
PTP Role	Timing Consumer (Follower / Slave)
Additional Synchronization	NTP / SNTP

PTP Operating Behavior

- Synchronization reception with hardware timestamp at the first node directly connected to the upstream Grandmaster Clock source
- Maintaining synchronization with software timestamp on subsequent nodes in daisy-chained multi-router deployments
- Targets time awareness, Sequence of Events (SOE), and system correlation for energy, SCADA, and edge networks

NOTE: SMG411 is not positioned as a hardware re-clock (Hard Boundary Clock) platform for telecom-core or 5G fronthaul/core deployments.

4. HARDWARE AND PHYSİCAL SPECİFİCATİONS

Component / Parameter	Specification / Value
Operating System	SMGOS® (Simgenet in-house developed software)
Expansion Architecture	PCIe-based modular expansion
Ethernet Uplink Support	1G and 10G Ethernet cards
Management Interface	CLI (Cisco IOS-like)
Power Supply	1× 220 VAC PSU
Form Factor	1U Rackmount, 19"
Dimensions (W×D×H)	[Technical information to be added]
Weight	[Technical information to be added]
Operating Temperature	-5 °C ~ +50 °C
Storage Temperature	-20 °C ~ +75 °C
Relative Humidity	10% to 95% (non-condensing)
Certification	N/A

7. USE CASES

SMG411 is a compact IP/MPLS edge router platform with full SMGOS protocol support, intended for deployment in protected technical buildings and telecom room environments. For EMC requirements, please refer to the table below.

Use Case	Suitability	Description
Telecom room / ISP POP	✓ Suitable	Protected telecom environment is the primary use case
Enterprise network room / DC edge	✓ Suitable	Data center and enterprise network exit points
Railway — inside station technical building	✓ Suitable	Suitable for installation inside protected technical buildings at stations and junction points
Substation / Power Plant — inside control building	✓ Suitable	Suitable for rack installation inside protected control buildings at 154/400 kV substations and power plants
154/400 kV busbar vicinity / outdoor field	✗ SMG818V5	Industrial SMG818V5 should be used
Railway outdoor cabinet / along the line	✗ SMG818V5	Industrial SMG818V5 should be used

EMC Note: Since SMG411 includes an industrial PSU, it provides at least Level 1 compliance within the scope of the EN 61000-4 series. For applications near outdoor fields, power generation facilities, and 154/400 kV busbars with high EMC requirements, the EN 61000-4 Level 3–4 compliant SMG818V5 Industrial IP/MPLS Router should be preferred.

9. CERTİFİCATİON AND INDUSTRİAL RUGGEDNESS

- Design compliant with CE (EMC / LVD) and RoHS requirements
- Components compliant with FCC and other regional regulations
- Power infrastructure designed with EN 61000-4 series immunity criteria in mind
- Industrial-grade server power supply architecture
- Hardware design suitable for energy, railway, industrial facilities, as well as telecom and ISP field environments
- Optimized for long-term, continuous 24/7 field operation

CLI Connection — Quick Start

To access the CLI interface, connect to the device's console port using the original console cable. Use PuTTY or a similar terminal application and apply the settings below:

Parameter	Value
Connection Port	Console Port (RJ-45)
Baud Rate	115200
Data Bits	8
Stop Bits	1
Parity	None
Terminal	PuTTY or similar SSH/Serial terminal